



## Department of Energy

Brookhaven Site Office

P.O. Box 5000

Upton, New York 11973

Mr. Michael J. Bebon, PE  
Brookhaven Science Associates, LLC  
Brookhaven National Laboratory  
Upton, New York 11973

OCT 24 2007

Dear Mr. Bebon:

SUBJECT: APPROVAL OF THE REVISIONS TO THE ALTERNATING GRADIENT SYNCHROTRON (AGS), BOOSTER AND LINAC ACCELERATOR SAFETY ENVELOPE (ASE) AND THE NASA SPACE RADIATION LABORATORY (NSRL) ASE

Reference: Letter from M. Bebon, BSA, to M. Holland, BHSO, Subject: "Request for Approvals for Revisions to AGS, Booster and Linac Accelerator Safety Envelope (ASE) Dated July 5, 2007 and the NSRL ASE Dated June 29, 2007", Dated August 13, 2007.

The Brookhaven Site Office (BHSO) has reviewed your request for revision of the AGS, Booster, and LINAC ASE and the request for revision of the NSRL ASE.

The AGS, Booster, and LINAC request concerns the inclusion of more frequent inspections for the g-2 and BLIP spur impermeable caps (rainwater barriers) in accordance with the Record of Decision dated April 6, 2007. Section 4.5.1 of the ASE will be revised to require semiannual visual inspections of the caps.

The NSRL request concerns the removal of the requirement to test the HEPA filters located in exhaust ducts associated with the two animal rooms. HEPA filtration is not necessary for these ducts since no animals are brought into the NSRL facility that are infected with Biosafety Level II biological agents. Section 4.8 of the ASE will be removed which will eliminate the requirement for testing the HEPA filters. Based on our review, the proposed ASE revisions are approved.

If you have any questions, please contact Peter Kelley of my staff at extension 5784.

Sincerely,

Michael D. Holland  
Site Manager

cc: R. Desmarais, SC-BHSO  
D. Lowenstein, BSA  
E. Lessard, BSA  
R. Karol, BSA



Building 911  
P.O. Box 5000  
Upton, NY 11973-5000  
Phone 631 344-4250  
lessard@bnl.gov

managed by Brookhaven Science Associates  
for the U.S. Department of Energy

## Memo

**Date:** August 1, 2007

**To:** M. Bebon, Deputy Director for Operations

**From:** E. Lessard, <sup>ETZ</sup>Chair BNL Environment, Safety and Health Committee

**Subject:** LESHHC Recommendation for Approval of the Proposed AGS, Booster and Linac Accelerator Safety Envelope (ASE) dated July 5, 2007 and the NSRL ASE dated June 29, 2007 Revisions

The BNL ES&H Committee has reviewed the 1) proposed change to the AGS, Booster and Linac ASE, dated July 5 2007, to include more frequent inspections for the g-2 and BLIP spur impermeable caps in accordance with the recent Record of Decision and the 2) the proposed change to the NSRL Accelerator Safety Envelope, dated June 29, 2007, to remove the requirement for the unnecessary HEPA filters in the animal rooms exhaust ventilation system.

The proposed ASE revisions were drafted by Collider-Accelerator Department (C-AD) staff. The change to the NSRL ASE also included technical justification from the BNL Veterinarian and the BNL Animal Facility Manager.

The LESHHC email review generated several Committee Member questions, which were satisfactorily answered. No changes to the proposed ASE were required.

Therefore, in accordance with the BNL "Accelerator Safety" Subject Area we recommend that you send the two proposed ASE changes to the DOE Brookhaven Site Office for approval. A copy of this document is included with this transmittal to aid in your review. The formal (signoff copy) of the ASE will be transmitted by C-AD to you shortly.

Email copies to:  
Committee Members  
P. Bond  
D. Lowenstein



## Accelerator Safety Envelope

**Title of Facility:** AGS, Booster and Linac

**Date of Initial ASE:** May 30, 2003

**Subsequent Revision Dates:** August 13, 2004, July 5, 2007

**Version of the SAD that the ASE applies to:** C-AD SAD, August 2004

**Signature of Preparer:**

Edward T Lessard

**Signature of Collider-Accelerator Department Chair:**

Paul J. Levinson

**Signature of Nuclear and Particle Physics Associate Laboratory  
Director:**

Peter D. Bond

**Signature of Deputy Director for Operations:**

Michael E. Bond

### ASE Contents:

Section 1: Introduction.....	2
Section 2: BNL Safety Envelope Limits.....	2
Section 3: Corresponding AGS, Linac and Booster Safety Envelope Parameters .....	3
AGS, Linac and Booster Particle Limit and Limits on Particle Loss .....	3
Control of Beam Loss .....	3
Classification of Radiological Areas .....	4
Access Controls System (ACS) .....	4
Oxygen Deficiency Hazard (ODH) Control .....	4
Fire Protection.....	4
Section 4: Engineered Safety Systems Requiring Calibration, Testing, Maintenance, and Inspection.....	5
Section 5: Administrative Controls.....	6



## Section 1: Introduction

The ASE Requirements define the conditions, safe boundaries, and the administrative controls necessary to ensure safe AGS, Linac and Booster operations and to reduce the potential risk to the public, workers and environment.

- 1.1 The reference to the method used by the Collider-Accelerator Department for change control of the ASE is the BNL Subject Area on Accelerator Safety.
- 1.2 A variation beyond the boundaries described in Sections 1, 2, 3, and 4 of this ASE shall be treated as a violation of the ASE and shall be a reportable occurrence, as defined by the BNL SBMS Subject Area on Occurrence Reporting. A violation is defined as not satisfying a Requirement or its specific Authorized Alternative. C-A Department staff shall make notifications of occurrences according to the requirements in the C-A Operations Procedure Manual.
  - 1.2.1 If a Requirement is not satisfied and it has a specific Authorized Alternative, implement the Authorized Alternate or stop the activity that uses the affected equipment within one hour.
- 1.3 Emergency actions may be taken that depart from these approved ASE Requirements when no actions consistent with the Requirements are immediately apparent and when these actions are needed to protect the public, worker and environmental safety. These actions shall be approved by the person in charge of facility safety, as defined in the operating procedures, when the emergency occurs and shall be reported to C-AD management within 2-hours.

## Section 2: BNL Safety Envelope Limits

This section contains the absolute limits that BNL places on its operations to ensure that we meet the regulatory limits established to protect our environment, public and staff/visitors and that those operations are conducted within the assumptions of the AGS, Linac and Booster safety analyses documented in the C-AD SAD, August 2004. BNL Safety Envelope Limits for AGS, Linac and Booster operations are:

- 2.1. Less than 25 mrem in one year to individuals in other BNL Departments or Divisions adjacent to a Collider-Accelerator Department accelerator facility.
- 2.2. Less than 5 mrem in one year to a person located at the site boundary.
- 2.3. Offsite drinking water concentration and on-site potable well water concentration must not result in 4 mrem or greater to an individual in one year.
- 2.4. Less than 1250 mrem in one year to a Collider-Accelerator Department staff member.



- 2.5. Maximum tritium concentration of 10,000 pCi/L in the BNL sanitary sewer effluent, caused by liquid discharges from AGS, Linac and Booster facilities averaged over a 30-day interval.
- 2.6 In order to protect groundwater, if the annual activity concentration of sodium-22 or tritium in leachate is calculated to exceed 5% of the Drinking Water Standard, then a cap shall be used unless BNL Management is convinced otherwise<sup>1</sup>.
- 2.7 All emissions from AGS, Linac and Booster facilities are managed in accordance with the Air Emissions subject area<sup>2</sup>. If emissions are anticipated to exceed 0.1 mrem per year to the Maximally Exposed Individual, actions will be taken to ensure operations comply with NESHAP requirements including continuous emissions monitoring and permitting.

### Section 3: Corresponding AGS, Linac and Booster Safety Envelope Parameters

This section identifies the measurable limitations on critical operating parameters that, in conjunction with the specifically identified hazard control considerations established by the facility design and construction, ensure that AGS, Linac and Booster operations will not exceed the corresponding Safety Envelope Limits discussed in Section 2. These parameters are derived from the safety analyses described in the C-AD SAD, August 2004. AGS, Linac and Booster Safety Envelope Parameters are:

#### AGS, Linac and Booster Particle Limit and Limits on Particle Loss

- 3.1. The maximum product of the number of high energy unpolarized protons or polarized protons and particle energy in the Linac shall not exceed  $9 \times 10^{17}$  GeV in one hour.
- 3.2 The maximum product of the number of high energy unpolarized protons, polarized protons or heavy ions and particle energy in the AGS ring shall not exceed  $1.1 \times 10^{19}$  GeV in one hour.
- 3.3 The maximum product of the number of high energy unpolarized protons, polarized protons or heavy ions and particle energy in the Booster ring shall not exceed  $5.4 \times 10^{17}$  GeV in one hour.

#### Control of Beam Loss

- 3.4 Loss monitoring results and radiation survey results shall be used in order to maintain beam loss "As Low As Reasonably Achievable" as defined in the BNL Radiological Control Manual. The following requirements keep the skyshine dose to levels below the limits in 2.1 and 2.2:

<sup>1</sup> BNL SBMS Accelerator Safety Subject Area, Design Practice for Known Beam Loss Locations.

<sup>2</sup> BNL SBMS Subject Area, Radioactive Airborne Emissions.



- 3.4.1 The measured dose rate on the surface of the AGS Ring shielding above the A, F, H and J superperiods shall average less than 1100 mrem/h averaged over 36 weeks of operation. The limiting location is the site boundary.
- 3.4.2 The measured dose rate on the roof over Building 914 or the shield above the Booster scraper shall average less than 15 mrem/h averaged over 200 days of operation. The limiting location is Building 931, which belongs to the Medical Department.
- 3.4.3 The measured dose rate on the beam stop surfaces shall average less than 1300 mrem/h averaged over 20 weeks of operation for a beam stop surface area of 2000 ft<sup>2</sup>. The limiting location is the site boundary.
- 3.4.4 Beam loss induced radiation within uncontrolled areas is less than 0.5 mrem in an hour and for repeated losses less than 25 mrem in a year.
- 3.4.5 Beam loss induced radiation in a Controlled Area is less than 5 mrem in an hour and for repeated losses less than 100 mrem in a year.

#### **Classification of Radiological Areas**

- 3.5 Radiological area classifications shall be in accord with requirements in the BNL Radiation Control Manual.

#### **Access Controls System (ACS)**

- 3.6 The Access Controls System shall be functional during operations with beam.
- 3.7 During the running period, area radiation monitors that are interfaced with the Access Controls System shall be within their calibration date.
- 3.8 During the running period, the locations of area radiation monitors interfaced with ACS are to be configuration controlled.

#### **Oxygen Deficiency Hazard (ODH) Control**

- 3.9 ODH area classification and controls shall in accord with the requirements in the BNL SBMS Subject Area, ODH Classification / Controls.

#### **Fire Protection**

- 3.10 During periods of beam operation, when access to the primary beam areas is prohibited the installed fire detection and suppression systems shall be operable.



Authorized Alternative: Within 2 hours of discovery, the Department Chair or designee may allow partial or full inoperability of any fire detection and/or suppression system for up to 80 hours with beam operations if the benefit of continuing AGS, Linac or Booster operations is judged to outweigh the potential risk of fire damage. Operating procedures shall specify the compensatory actions to be taken during inoperability.

- 3.11 During periods of shutdown, and if the facility is to be occupied, either the installed fire detection and suppression systems or the manual fire alarm stations in the occupied areas shall be operable.

Authorized Alternative: The Operations Coordinator, ESH Coordinator or designee may allow partial or full inoperability of any fire detection system, suppression system or manual alarm station in occupied areas as long as a Fire Watch is posted who can verbally communicate with the BNL Fire/Rescue Group by radio or phone.

- 3.12 Personnel may occupy the AGS, Linac or Booster tunnel if the exhaust fans, required for personnel protection during an emergency, can be activated manually or automatically.

Authorized Alternative: If exhaust fan operability in the affected area cannot be restored within one hour, then empty the affected area and prevent occupancy until operability is restored.

#### **Section 4: Engineered Safety Systems Requiring Calibration, Testing, Maintenance, and Inspection**

The systems and requirements for calibration, testing, maintenance, accuracy or inspection necessary to ensure the operational integrity of the Safety Envelope Parameters during operations are given in this section:

- 4.2 Access Controls System (ACS) shall be functionally tested in accordance with requirements in the BNL Radiological Control Manual. AGS, Linac and Booster fire protection systems shall undergo annual testing (not to exceed 15 months).
- 4.3. Area radiation monitors shall undergo annual testing (not to exceed 15 months).
- 4.4. Radiological barriers shall undergo annual visual inspection (not to exceed 15 months).
- 4.5. Rainwater barriers for activated soil shall undergo annual visual inspection (not to exceed 15 months).



4.5.1 The rainwater barriers for the g-2 and the BLIP spur activated soil areas shall be visually inspected semiannually (not to exceed 8 months)<sup>3,4</sup>

## Section 5: Administrative Controls

Administrative controls necessary to ensure the operational integrity of the Safety Envelope Parameters during operations are:

### 5.1. Minimum Main Control Room Staffing

- 5.1.1. C-A Main Control Room: Two Operators shall be on duty for Linac only beam operation and one Operations Coordinator and one Operator shall be on duty for all other beam operations. During normal operations, one of the two must remain in the Main Control Room at all times.

Authorized Alternative: If one operator is incapacitated, the remaining operator may continue operations as long as manning requirements are restored within two hours.

### 5.2. Liquid Hydrogen Target Experiment Staffing

Cryogenic Target Watch: one Cryogenic Section Technician shall be on watch when liquid hydrogen is in use in the experimental area.

- 5.3. On-shift operations and technician staff shall be trained and qualified on their safety, operational and emergency responsibilities. Records of training and qualification shall be maintained on the Brookhaven Training Management System (BTMS).
- 5.4. Work planning and control systems shall comply with the requirements in the C-A Operations Procedure Manual.
- 5.5. Environmental management shall comply with the requirements in the C-A Operations Procedure Manual.
- 5.6. Experiment modification and review shall comply with the requirements in the C-A Operations Procedure Manual.
- 5.6.1. Each experiment in the Linac, Booster, AGS, AGS Experimental Halls, U-line, V-line and Building 919 shall be reviewed before running with beam.

<sup>3</sup> Medical Department and Collider-Accelerator Department, Memorandum of Understanding BLIP and g-2 Cap Inspection Process dated June 25, 2007.

<sup>4</sup> Record of Decision for Area of Concern 16T g-2 Tritium Source Area and Groundwater Plume, Area of Concern 16K Brookhaven Linac Isotope Producer and Area of Concern 12 Former Underground Storage Tanks dated April 6, 2007.



- 5.7. Modifications of the AGS, Linac and Booster that are known to increase the oxygen deficiency hazards shall be reviewed and approved by the C-A Accelerator Systems Safety Review Committee.
- 5.8. Industrial hazards shall be controlled in accordance with the applicable portions of the BNL SBMS Subject Area.



## Accelerator Safety Envelope

**Title of Facility:** NASA Space Radiation Laboratory (NSRL)

**Date of Initial ASE:** June 15, 2001

**Subsequent Revision Dates:** May 30, 2003, August 13, 2004, June 29, 2007

**Version of the SAD that the ASE applies to:** C-AD SAD, August 2004

**Signature of Preparer:**

Edward T Lessard

**Signature of Collider-Accelerator Department Chair:**

Paul J. Schmitzer

**Signature of Nuclear and Particle Physics Associate Laboratory Director:**

Peter J. Bond

**Signature of Deputy Director for Operations:**

Michael B. ...

**ASE Contents:**

Section 1. Introduction .....	2
Section 2: BNL Safety Envelope Limits .....	2
Section 3: Corresponding NSRL Safety Envelope Parameters .....	3
NSRL Beam Limits in Terms of the Product of Nucleon Energy and Flux.....	3
Control of Beam Loss.....	3
Classification of Radiological Areas .....	4
Access Controls .....	4
Fire Protection .....	4
Section 4: Engineered Safety Systems Requiring Calibration, Testing, Maintenance, and Inspection .....	5
Section 5: Administrative Controls .....	5



## Section 1. Introduction

The ASE Requirements define the conditions, safe boundaries, and the administrative controls necessary to ensure safe NSRL operations and to reduce the potential risk to the public, workers and environment.

- 1.1 The reference to the method used by the Collider-Accelerator Department for change control of the ASE is the BNL Subject Area on Accelerator Safety.
- 1.2 A variation beyond the boundaries described in Sections 1, 2, 3, and 4 of this ASE shall be treated as a violation of the ASE and shall be a reportable occurrence, as defined by the BNL SBMS Subject Area on Occurrence Reporting. A violation is defined as not satisfying a Requirement or its specific Authorized Alternative. C-A Department staff shall make notifications of occurrences according to the requirements in the C-A Operations Procedure Manual.
  - 1.2.1 If a Requirement is not satisfied and it has a specific Authorized Alternative, implement the Authorized Alternate or stop the activity that uses the affected equipment within one hour.
- 1.3 Emergency actions may be taken that depart from these approved ASE Requirements when no actions consistent with the Requirements are immediately apparent and when these actions are needed to protect the public, worker and environmental safety. These actions shall be approved by the person in charge of facility safety, as defined in the operating procedures, when the emergency occurs and shall be reported to C-AD management within 2-hours.

## Section 2: BNL Safety Envelope Limits

This section contains the absolute limits that BNL places on its operations to ensure that we meet the regulatory limits established to protect our environment, public and staff/visitors and that those operations are conducted within the assumptions of the NSRL safety analyses documented in the C-AD SAD, August 2004. Please note that the construction project was referred to as the Booster Applications Facility (BAF) and the operational facility is referred to as the NASA Space Radiation Laboratory (NSRL). BNL Safety Envelope Limits for NSRL operations are:

- 2.1. Less than 25 mrem in one year to individuals in other BNL Departments or Divisions adjacent to this Collider-Accelerator Department accelerator facility.
- 2.2. Less than 5 mrem in one year to a person located at the site boundary.
- 2.3. Offsite drinking water concentration and on-site potable well water concentration must not result in 4 mrem or greater to an individual in one year.
- 2.4. Less than 1250 mrem in one year to a Collider-Accelerator Department staff member.



- 2.5. Maximum tritium concentration of 10,000 pCi/L in the BNL sanitary sewer effluent, caused by liquid discharges from NSRL facilities averaged over a 30-day interval.
- 2.6. In order to protect groundwater, if the annual activity concentration of sodium-22 or tritium in leachate is calculated to exceed 5% of the Drinking Water Standard, then a cap shall be used unless BNL Management is convinced otherwise.<sup>1</sup>
- 2.7. All emissions from NSRL facilities are managed in accordance with the Air Emissions subject area.<sup>2</sup> If emissions are anticipated to exceed 0.1 mrem per year to the Maximally Exposed Individual, actions will be taken to ensure operations comply with NESHAP requirements including continuous emissions monitoring and permitting.

### Section 3: Corresponding NSRL Safety Envelope Parameters

This section identifies the measurable limitations on critical operating parameters that, in conjunction with the specifically identified hazard control considerations established by the facility design and construction, ensure that NSRL operations will not exceed the corresponding Safety Envelope Limits discussed in Section 2. These parameters are derived from the safety analyses described in the C-AD SAD, August 2004. NSRL safety envelope parameters are:

#### NSRL Beam Limits in Terms of the Product of Nucleon Energy and Flux

- 3.1. The annual limit on the number and kinetic energy of high-energy nucleons extracted from the Booster SEB system shall be no greater than  $10^{17}$  GeV in one year.
- 3.2. The hourly limit on the number and kinetic energy of high-energy nucleons extracted from the Booster SEB system shall be no greater than  $6 \times 10^{14}$  GeV in one hour.
- 3.3. The hourly limit on the number and kinetic energy of high-energy nucleons entering the NSRL Target Room and beam stop shall be no greater than  $6 \times 10^{14}$  GeV in one hour.
- 3.4. The maximum annual high-energy flux on the NSRL beam stop shall be no greater than  $3 \times 10^{16}$  GeV in one year.

#### Control of Beam Loss

- 3.5. Loss monitoring results and radiation survey results shall be used in order to maintain beam loss "As Low as Reasonably Achievable" as defined in the BNL Radiological Manual.

---

<sup>1</sup> BNL SBMS Accelerator Safety Subject Area, Design Practice for Known Beam Loss Locations.

<sup>2</sup> BNL SBMS Subject Area, Radioactive Airborne Emissions.



- 3.6. Beam loss induced radiation within uncontrolled areas is to be less than 0.5 mrem in an hour and for repeated losses less than 25 mrem in a year.
- 3.7. Beam loss induced radiation in a Controlled Area is to be less than 5 mrem in an hour and for repeated losses less than 100 mrem in a year.

#### **Classification of Radiological Areas**

- 3.8. Radiological area classifications during operations shall be in accord with requirements in the BNL Radiation Control Manual.

#### **Access Controls**

- 3.9. The Access Controls System shall be functional during operations with beam.
- 3.10 During the running period, area radiation monitors that are interfaced with the Access Controls System shall be within their calibration date.
- 3.11 During the running period, the locations of area radiation monitors interfaced with the Access Control System are to be configuration controlled.

#### **Fire Protection**

- 3.12 During periods of beam operation, when access to the primary beam areas is prohibited the installed fire detection and suppression systems shall be operable.

Authorized Alternative: Within 2 hours of discovery, the Department Chair or designee may allow partial or full inoperability of any fire detection and/or suppression system for up to 80 hours with beam operations if the benefit of continuing NSRL operations is judged to outweigh the potential risk of fire damage. Operating procedures shall specify the compensatory actions to be taken during inoperability.

- 3.13 NSRL magnets and power supplies may be energized if the smoke detection system for the energized area can transmit an alarm to summon the BNL Fire/Rescue Group.

Authorized Alternative: The Operations Coordinator, ESH Coordinator or designee may allow partial or full inoperability of any fire detection system, suppression system or manual alarm station in occupied areas as long as a Fire Watch is posted who can verbally communicate with the BNL Fire/Rescue Group by radio or phone.



#### **Section 4: Engineered Safety Systems Requiring Calibration, Testing, Maintenance, and Inspection**

The systems and requirements for calibration, testing, maintenance, accuracy or inspections necessary to ensure the integrity of the NSRL safety envelope parameters during operations are given in this section:

- 4.1. The Access Control System shall be functionally tested in accordance with requirements in the BNL Radiation Control Manual.
- 4.2. Target Room and Support Building ventilation exhaust fans shall undergo annual testing (not to exceed 15 months).
- 4.3. NSRL fire protection shall undergo annual testing (not to exceed 15 months).
- 4.4. Area radiation monitors shall undergo annual testing (not to exceed 15 months).
- 4.5. Radiological barriers shall undergo annual visual inspection (not to exceed 15 months).
- 4.6. Rainwater barriers for activated soil shall undergo annual visual inspection (not to exceed 15 months).
- 4.7. In the Support Laboratories, Class II Type A biological-safety-cabinet (BSC) HEPA-filter efficiency and cabinet face-velocity-tests shall be performed *in situ* at the time of installation, at any time the BSC is moved, and at least annually thereafter (not to exceed 15 months).

#### **Section 5: Administrative Controls**

Administrative controls necessary to ensure the integrity of the NSRL safety envelope parameters during operations are:

##### **5.1. Minimum Main Control Room Staffing**

- 5.1.1. C-A Main Control Room: one Operations Coordinator and one Operator shall be on duty when NSRL beam is in operation. During normal operations, one of the two must remain in the Main Control Room at all times.

Authorized Alternative: If one operator is incapacitated, the remaining operator may continue operations as long as manning requirements are restored within two hours.

##### **5.2. Experiment Area Staffing**



- 5.2.1. The minimum experimental area staffing shall be a qualified Collider Accelerator Support (CAS) watch person for NSRL experimental operations with beam.
- 5.3. On-shift operations staff shall be trained and qualified on their safety, operational and emergency responsibilities. Records of training and qualification shall be maintained on the Brookhaven Training Management System (BTMS).
- 5.4. Work planning and control systems shall comply with the requirements in the C-A Operations Procedure Manual.
- 5.5. Environmental management shall comply with the requirements in the C-A Operations Procedure Manual.
- 5.6. Experiment modification and review shall comply with the requirements in the C-A Operations Procedure Manual.
  - 5.6.1. Each experiment in the NSRL Target Room shall be reviewed before running with beam. It is noted that an experiment may lie dormant for a period greater than one year between runs and not require a review during the dormancy period. For experiments that may run more than once within a 12-month period, review shall occur before each singular scheduled run.
- 5.7 Industrial hazards shall be controlled in accordance with the applicable portions of the BNL SBMS Subject Area.



**BROOKHAVEN**  
NATIONAL LABORATORY

Building 460  
P.O. Box 5000  
Upton, NY 11973-5000  
Phone 631 344-3434  
Fax 631 344-2361  
bebon@bnl.gov

managed by Brookhaven Science Associates  
for the U.S. Department of Energy

www.bnl.gov

August 13, 2007

Mr. Michael Holland  
Brookhaven Site Office Manager  
U. S. Department of Energy  
Upton, New York 11973-5000

Dear Mr. Holland:

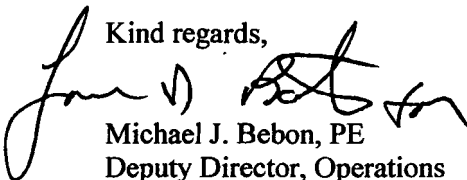
**SUBJECT: Request for Approvals for Revisions to AGS, Booster and Linac Accelerator Safety Envelope (ASE) dated July 5, 2007 and the NSRL ASE dated June 29, 2007**

I concur with the Laboratory ESH Committee (LESHC) recommendations to approve the proposed modifications to the following two Collider-Accelerator Department ASEs:

1. The AGS, Booster and Linac ASE to include more frequent inspections for the g-2 and BLIP spur impermeable caps in accordance with the recent Record of Decision.
2. The NSRL Accelerator Safety Envelope to remove the requirement for the unnecessary HEPA filters in the animal rooms exhaust ventilation system.

I am submitting these changes to the Area Office for review and approval. Attached are relevant files to assist you.

Kind regards,



Michael J. Bebon, PE  
Deputy Director, Operations  
Attachments:

1. Recommendation Memorandum from the LESHC
2. Signed copy of AGS, Booster and Linac ASE dated July 5, 2007
3. Signed copy of NSRL ASE dated June 29, 2007

Copy to: P. Bond

D. Lowenstein  
E. Lessard ✓  
R. Karol





## Department of Energy

Brookhaven Site Office  
P.O. Box 5000  
Upton, New York 11973

AUG 06 2004

Mr. Michael Bebon  
Brookhaven Science Associates, LLC  
Brookhaven National Laboratory  
Upton, New York 11973

Dear Mr. Bebon:

SUBJECT: APPROVAL OF THE PROPOSED COLLIDER-ACCELERATOR DEPARTMENT  
ACCELERATOR SAFETY ENVELOPE (ASE) MODIFICATIONS

Reference: Letter, from T. Sheridan, BSA to M. Holland, BHSO, Recommendation for  
Approval of the Proposed C-AD Accelerator Safety Envelope Modifications,  
dated August 5, 2003.

The Brookhaven Site Office has completed reviewing the proposed ASE modifications for the:

- Tandem Van de Graaf/Tandem to Booster Transfer Line (TVDG/TTB)
- Alternating Gradient Synchrotron (AGS), Booster, and LINAC
- NASA Space Radiation Laboratory (NSRL)
- Relativistic Heavy Ion Collider (RHIC)

Based on our review, the above ASE modifications are approved. If you have any questions, please call Peter Kelley of my staff at extension 5784.

Sincerely,

A handwritten signature in black ink, appearing to read "M. Holland", is written over the typed name.

Michael D. Holland  
Brookhaven Site Manager

cc: D. Lowenstein, BSA  
E. Lessard, BSA  
R. Karol, BSA





Building 460  
P.O. Box 5000  
Upton, NY 11973-5000  
Phone 631 344-8627  
Fax 631 344-2361  
sheridan@bnl.gov

managed by Brookhaven Science Associates  
for the U.S. Department of Energy

[www.bnl.gov](http://www.bnl.gov)

August 5, 2003

Mr. Michael D. Holland  
Manager, Brookhaven Area Office  
U.S. Department of Energy  
Building 464  
Upton, NY 11973

**Subject: Recommendation for Approval of the Proposed C-AD Accelerator Safety Envelope (ASE) Modifications**

Dear Mr. Holland:

Attached for your review and approval are proposed modifications to the BNL Collider-Accelerator Department's Accelerator Safety Envelope which includes 1) Tandem Van de Graaff/Tandem to Booster Transfer Line (TVDG/TTB) ASE; 2) Alternating Gradient Synchrotron (AGS), Booster and Linac ASE; 3) NASA Space Radiation Laboratory (NSRL) ASE; and 4) Relativistic Heavy Ion Collider (RHIC) ASE. A memo provided by the Laboratory Environment, Safety & Health Committee (LESHC) supporting this request for approval is attached.

If you have any questions, please contact Ed Lessard on X4250.

Sincerely yours,

A handwritten signature in black ink, appearing to read "T. Sheridan", written over a horizontal line.

Thomas R. Sheridan  
Deputy Director, Operations

TRS/lim

Attachment:

Memo dated 7/18/03, E. Lessard (LESHC Chair) to T. Sheridan

cc: M. Butler  
E. Lessard  
D. Lowenstein ✓  
S. Ozaki



**BROOKHAVEN**  
NATIONAL LABORATORY

Managed by Brookhaven Science Associates  
for the U.S. Department of Energy

**Date:** July 18, 2003

**To:** T. Sheridan, Deputy Director for Operations

**From:** E. Lessard, Chair, BNL Environment, Safety and Health Committee

**Subject:** LESHC 03-02, Recommendation for Approval of the Proposed C-A  
Department's Accelerator Safety Envelope (ASE) Modifications

The BNL ES&H Committee has reviewed the proposed modifications to the Collider-Accelerator Department's active ASEs. They include:

- 1) Tandem Van de Graaff/Tandem to Booster Transfer Line (TVDG/TTB) ASE
- 2) Alternating Gradient Synchrotron (AGS), Booster and Linac ASE
- 3) NASA Space Radiation Laboratory (NSRL) ASE
- 4) Relativistic Heavy Ion Collider (RHIC) ASE

In our meeting of June 5, 2003, the Committee raised several questions during the course of the review. The C-AD staff addressed all of our questions satisfactorily.

The Meeting Minutes are attached for your information. In summary, the ASEs were revised using the draft DOE Accelerator Safety Guide, as supplemented with the DOE guidance for reactor Technical Safety Requirements, particularly for non radiation hazards, emergency actions, authorized alternatives, and surveillance interval extension allowances.

The following lists the major revisions to the four ASEs:

- 1) The ASEs were reformatted to conform with the SBMS Accelerator Safety requirements
- 2) For uncontrolled areas and adjacent non-C-AD facilities, several ASEs used the DOE 100 mrem annual dose limit. The BNL administrative control limit of 25 mrem in one year is now specified in all ASEs
- 3) The RHIC ASE was modified to remove the detailed ODH requirements and a commitment to satisfy the SBMS ODH requirements was inserted
- 4) Environmental requirements for control of groundwater contamination and airborne release were clarified and made consistent among the ASEs
- 5) The Experimental Review requirement was added to all ASEs
- 6) A commitment to control industrial hazards in accord with SBMS requirements was added to all ASEs
- 7) The use of "Authorized Alternatives," to be implemented if an ASE requirement is not met, has been added where appropriate in all of the ASEs. This concept, as it applied to C-AD fire protection systems, was reviewed and approved in LESHC Meeting 03-01
- 8) A 25% extension allowance on surveillance intervals was added



- 9) Guidance on ESH emergency actions that depart from ASE requirements was added to all ASEs.

By unanimous vote, the Committee recommends your approval of these documents, subject to the following four conditions. The Collider-Accelerator Department (C-AD) will:

- 1) Present a critique to their departmental management whenever an authorized alternative is exercised
- 2) Determine if the proposed 25% extension allowance for surveillances is appropriate for radiation monitoring equipment – **Complete**<sup>1</sup>
- 3) Modify Section 2 of each ASE to explicitly state the tritium and sodium-22 concentration limits as 5% of the Drinking Water Standard and to reference the Accelerator Safety Subject Area, "Design Practice for Known Beam Loss Locations" – **Complete**<sup>1</sup>
- 4) Provide an information copy of the operating procedure to the LESH in parallel with the ASE approval process

Copy to (via Email):

Committee Members

S. Hoey

R. Karol

P. Kelley (BAO)

D. Lowenstein

Y. Makdisi

T. Monahan

J. Tarpinian

---

<sup>1</sup> Please note that conditions 2 and 3 have been completed in the interim between our June 5<sup>th</sup> meeting and the date of this letter.